

FLUID IMPERMEABLE CABINET LINERS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on provisional patent application which has been assigned U.S. Serial No. 60/430,232, filed December 2, 2002. The complete disclosure of the above application is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates generally to fluid impermeable liners, and particularly relates to fluid impermeable liners for use in various standard and custom cabinet applications.

BACKGROUND OF THE INVENTION

[0003] In many instances, indoor plumbing is often concealed or hidden by various structures. For example, plumbing is often directed or run through cabinets or other enclosed structures for a portion of its path. In these enclosed structures, it is often difficult to notice or detect a leak before a larger problem develops. For example, a supply line or a drain line may crack or become loosened over time, so that water begins to drip out of that particular line.

[0004] Particularly, sinks or basins are installed in cabinets that are placed on the floor. Most often, these cabinets are formed of wood or other fluid permeable materials. If fluid collects in these materials, especially over time, the cabinet

materials can become warped or destroyed. Generally, this requires an expensive and extended repair time.

[0005] Many cabinets must be customized to accept the various supply and drain lines, which must be run through the cabinets to the basins or other appliances. Specifically, water supply lines and waste and away lines are often run through cabinets to a main water supply or waste line. The cabinets must be altered from a standard configuration to accept the use of different plumbing lines. Moreover, the basins themselves may be specifically altered to accept various sinks or appliances.

[0006] It is, therefore, desirable to provide a system, which can collect water or fluid from leaks in hidden areas. Particularly, it is desirable to provide a system that can prevent damage to expensive cabinetry or structural elements that would need to be replaced or repaired if damaged.

SUMMARY OF THE INVENTION

[0007] A liner for protecting a selected area from fluid leakage is disclosed. The liner is generally placed in a substantially enclosed area through which a fluid is generally communicated. The liner includes a first substantially planar portion to substantially cover a surface within the selected area. At least one wall extends from the planar portion to substantially enclose a selected volume. The planar portion and the extending walls are substantially fluid impermeable for a selected period of time, such that a fluid that is collected within the liner is contained in the liner and not allowed to escape.

[0008] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0010] Figure 1 is a perspective view of a cabinet including a cabinet liner according to an embodiment of the present invention;

[0011] Figure 2 is a top perspective view of a liner according to an embodiment of the present invention;

[0012] Figure 3 is a top perspective view of a liner according to a second embodiment of the present invention; and

[0013] Figures 3a and 3b are detailed cross-sectional views according to alternative embodiments of the embodiment illustrated in Figure 3;

[0014] Figure 4 is a top perspective view of a liner according to a third embodiment;

[0015] Figure 4a is a detailed view of Figure 4; and

[0016] Figure 5 is a top perspective view of a liner according to a fourth embodiment.

DETAILED DESCRIPTION OF VARIOUS EMBODIMENTS

[0017] The following description of various embodiments is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

[0018] With reference to Figure 1, a liner 10 is generally placed within a cabinet 12, which surrounds and encloses a basin, such as a kitchen sink. Enclosed within the cabinet 12 may be a plurality of items, which are designed to contain or communicate fluid, such as water. For example, the cabinet 12 may include a water filtration system 14, which includes a plurality of filters 16 and a filtered water holder 18. In addition, a garbage disposal 20 may be in communication between the sink and a waste line 22. The waste line 22 generally exits out a portion of the cabinet, such as a rear 12a of the cabinet. It will be understood, however, that the waste line 22 may also exit out a cabinet bottom 12b of the cabinet 12. In addition, supply lines, not particularly illustrated, may enter the cabinet 12 either through the cabinet back 12a or the cabinet bottom 12b. It will also be understood that the supply and the waste line 22 may enter or exit the cabinet 12 in any convenient or selected orientation. Nevertheless, the liner 10 is placed adjacent or parallel with the cabinet bottom 12b to protect the cabinet bottom 12b if any of the appliances or containers held therein happens to begin to leak. This is due to the fact that gravity will generally force water to flow towards the cabinet bottom 12b.

[0019] With reference to Figure 2, the liner 10 generally includes a substantially planar bottom portion or member 24, a first wall 26, a second wall 28, a third wall

30, and a fourth wall 32. Each of the four walls 26-32 extend upwardly from the base 24. Each of the walls 26-32 may extend at any selected angle from the base 24, but generally extend at a substantially 90° angle to the base 24, such that they fit tightly with the interior of the cabinet 12. Nevertheless, each of the upwardly extending walls may be formed at an angle which is internally obtuse to the bottom 24 of the liner 10, such that the top edge of the walls engage the cabinet 12 before the bottom 24 of the liner 10. In this way, water or other fluids are generally coaxed toward the center of the bottom 24 of the liner 10, rather than pooling or possibly running down outside of the walls 26-32.

[0020] The liner 10 may be formed of any appropriate material. For example, the liner may be formed of corrosion resistant metals, such as stainless steel, or of other water resistant or water repellant materials, such as generally known plastics. In addition, the liner 10 may be substantially rigid or at least slightly flexible or deformable.

[0021] Each of the walls 26-32 may be formed integrally with the liner bottom 24. For example, the liner 10 may be made of a single portion of material, which is stamped, such that each of the walls are stretched from the particular single piece of material. Alternatively, each of the walls may be welded at their ends, to the adjacent wall, and at the bottom to the bottom 24 of the liner 10. The welds are generally substantially water or fluid resistant, such that any fluid that is collected in the liner 10 remains in the liner 10. Other appropriate means, such as epoxy welding or adhesives can be used to affix the walls 26-32 to the bottom

24 and to each of the adjacent walls. In addition, the walls 26-32 may be bent upward to form the enclosed area.

[0022] With reference to Figure 3, an additional embodiment of a liner 100 is illustrated. The liner 100 includes a first liner portion 102 and a second liner portion 104. The first liner portion includes a bottom 106, a first wall 108, a second wall 110, a third wall 112, and a fourth wall 114. Each of the four walls 106-112 may be fixed to the bottom 106 through any appropriate method, such as those described above. In addition, the first liner portion 102 may be formed of any appropriate material, such as those described above. The second liner portion 104 also includes a bottom 120, a first wall 122, a second wall 124, a third wall 126, and a fourth wall 128. In addition, a catch or catch lip 130 extends from the fourth wall 128 over the first wall 108 of the first liner 102.

[0023] With continuing reference to Figure 3 and additional reference to Figure 3a, the first wall 108 of the first liner section 102 is received or caught within the catch 130, formed by the second liner portion 104. This allows the first liner portion 102 and the second liner portion 104 to form a substantially continuous water collecting area defined by the liner 100. Therefore, two liner portions 102 and 104 may be placed into the single cabinet 12 to cover the entire cabinet bottom 12b. For example, if a post or other obstacle is positioned within the cabinet 12, the first liner portion 102 may be first placed in the cabinet and the second liner portion 104 then engages the first liner portion 102 to form the substantially continuous liner 100.

[0024] It will be understood that the first liner portion 102 and the second liner portion 104 may be formed in any selected dimensions. In addition, the first liner portion 102 and the second liner portion 104 may not be of the same dimensions. Nevertheless, the first liner portion 102 may be received within the catch portion 130 of the second liner portion 104 to form a substantially contiguous liner 100. By providing multiple connecting liners, the size of the cabinet 12 may be measured and the corresponding size liners may be connected to achieve the proper fit. In this way, various standard size liners can be used to fit many different cabinets without needing to form custom liners. Moreover, more than two liners may be coupled together to achieve the desired size.

[0025] In addition, the catch portion 130 may be any appropriate design. Simply, the catch portion 130 is designed to ensure that the entire cabinet bottom 12b is substantially protected from leaks by the liner 100. For example, the catch portion 130 may be a separate member, such as the separate latch member 130' illustrated exemplary in Figure 3b. The first wall 108 of the first liner portion 102 is caught by the catch portion 130' in addition to the fourth wall 128 of the second liner portion 104. Therefore, the catch portion 130' substantially covers the area between the first liner portion 102 and the second liner portion 104 to insure that the liner 100 is substantially contiguous and covers the entire cabinet bottom 12b. The catch member 130 may also be rigidly affixed to the second liner portion 129.

[0026] According to an alternative embodiment, a cabinet liner 200 illustrated in Figure 4, generally includes a bottom 202, a first wall 204, a second wall 206, a

third wall 208, and a fourth convoluted wall 210. Each of the walls 204-210 may extend or be affixed to the bottom 202 according to any of the generally known methods. In addition, the liner 200 may be formed of any appropriate materials, such as those discussed herein.

[0027] The liner 200 includes the convoluted wall 210 to substantially surround an obstacle 212, exemplary a pipe 212, such as a drain pipe. The convoluted wall 210 can include any number of appropriate portions, but generally includes a first section 210a, a second section 210b, and a third section 210c. In this way, the convoluted wall 210 remains substantially continuous, such that each of the four walls 204-210 surround an area, which is covered by the bottom 202. Each of the convoluted portions 210a-210c are contiguous and can be affixed to the convoluted wall 210 and the other walls 204-208 through any generally known methods, such as welding or appropriate adhesives.

[0028] The convoluted portions 210a-210c can be used to allow the liner to be placed in substantially variable locations. It will be understood that the convoluted wall 210 may be any or all of the walls formed on the liner 200. Also, the convoluted wall 210 may include any number or shape of convoluted portions. Therefore, any obstructions can be accommodated with the convoluted wall 210.

[0029] With continuing reference to Figure 4 and additional reference to Figure 4a, the liner 200 including the convoluted wall 210 defines a channel 220 surrounded by the convoluted portions 210a-210c. The channel 220 represents an area, which is not covered by the bottom 202 of the liner. Therefore, a

possibility of fluids reaching the cabinet bottom 12b is presented. A cap 230 may be placed over the channel 220. The cap 230 includes a top 232, a first wall 234 and a second wall 236, a third wall 238 and a fourth wall 240. It will be understood that any appropriate number of walls may be used and a certain number of walls may be removed for ease of installation and removal. For example, the third wall 238 and fourth wall 240 may not be formed on the cap 230 to allow for ease of installation of the cap 230 over the channel 220. Nevertheless, for a substantial covering of the channel 220, the third wall 238 and fourth wall 240 may be provided. A gap is provided between each of the walls to allow the cap 230 to be placed over the convoluted portions 210a-c. In addition, the cap 230 may include a first flange 242 and a second flange 244 to assist in directing any fluids that may leak from the pipe 212 or other portions within the cabinet 12. It will also be understood that the cap 230 may not be completely removable from the liner 200. For example, the cap 230 may be hingedly affixed to one of the convoluted portions 210a-c to allow the cap to simply be tilted or hingedly moved to allow the liner 200 to be removed from the cabinet 12.

[0030] According to a fourth embodiment, a cabinet liner 300 generally includes a bottom 302, a first wall 304, a second wall 306, a third wall 308, and a fourth wall 310. Each of the walls may extend and be affixed to the bottom 302 through any appropriate methods, such as those described herein. Furthermore, the liner 300 may be formed of any appropriate materials, which are substantially fluid resistant, such as those discussed herein.

[0031] Furthermore, the liner 300 may include a first internal wall 312 and a second internal wall 314. The first internal wall 312 and second internal wall 314 may extend and be affixed to the liner bottom 302 and engage any of the other appropriate walls 304-310. The internal walls 312 and 314 substantially define a confined section 316 of the liner 300, which can be separated from the main liner bottom 302. The confined section 316 can be used to store items, which are desirable to not be contacted by fluids. Therefore, the main area 302 is positioned such that most leaks would generally occur in the main liner bottom 302. Alternatively, the confined section 316 may be used to engage or be placed in near those areas, which are specifically susceptible to leaks, thereby allowing the main liner bottom 302 to be kept dry. It will be understood, however, that any appropriate number of internal walls may be formed to provide separate and distinct areas from the main liner bottom 302.

[0032] One exemplary method of using the liner described herein, is to provide a liner to specifically fit any desired cabinet 12. Initially, measurements of the cabinet 12 can be taken to insure that the liner bottom will substantially cover the cabinet bottom 12b. It will be understood if the walls extending from the liner bottom extend at an angle other than a 90° angle that the liner bottom may be a dimension different than the dimension of the cabinet bottom 12b. The liner bottom can then be fabricated and the walls may be appropriately affixed or formed with the liner bottom. The liner bottom may be affixed to the walls in any appropriate water tight manner. Any obstructions may be allowed for by providing a channel 220 to receive any pipes or obstructions that may be

extending through where the liner is to be installed. These obstructions can be considered when the measurements are initially taken and designed for when the liner is being formed. If this occurs, a cap 230 may also be produced.

[0033] In addition, as previously discussed, if any large obstructions or uniquely sized cabinets are measured, the modular liner 100 may be used. The first liner portion 102 and a second liner portion 104 may be appropriately dimensioned so that they can be assembled inside of the cabinet 12 and latched together with the latch 130 to provide a substantially contiguous liner 100. Simply, the liner is designed to fit and be installed after it is formed.

[0034] Alternatively, several liner portions may be provided separately to an end user to select the desired number and sizes of liner portions that must be fixed together to fit the end users cabinet 12. For example, two or more of the liner portions, such as those illustrated in Figure 3, can be selected and fixed together with the latch 130'. Once an appropriate number and size of the liner portions are selected, they are installed and fixed together.

[0035] It will be understood that the planar portion need not be rectangular or square. The planar portion may define any appropriate shape to cover the desired area, such as a polygon or circle. It will also be understood that the appropriate number of wall portions are also provided to enclose the planar bottom to collect liquid that may drip into the liner.

[0036] Each of the liners may also include a drain portion, which allows collected fluid to be selectively drained out of a particular area. For example, a drain nozzle or projection may be formed in the liner to allow fluid to be selectively

removed from the liner at a selected time. Alternatively, the liner may be removed from the cabinet 12 and emptied of any collected fluid. Also, conveniently, a small amount of liquid collected in the liner can be removed with a sponge or other similarly absorbent material, rather than removing the entire liner.

[0037] The description of the invention is merely exemplary in nature and, thus, variations that do not depart from the gist of the invention are intended to be within the scope of the invention. Such variations are not to be regarded as a departure from the spirit and scope of the invention.